

Work Order ID 94309

December-06-12 11:48:22 AM

94309

Page 1

Item ID: D3177-041 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Bracket
 Start Date: 12/06/12 Start Qty: 2.00 ***2*** Cust Item ID:
 Required Date: 12/13/12 Req'd Qty: 2.00 ***2*** Customer:

Reference:

Approvals: Process Plan: W Date: Tooling: Date: Run Start ***NR1***
 QC: Date: SPC (Y/N): Date: Stop ***NR2***

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|---|----------------------|---------|-------------|--------------|---------------|---------------|------------------|----------------|
| Draw Nbr | Revision Nbr | | | | | | | | |
| D3177 | Rev B2 | | | | | | | | |
| 100 | | 0.00 | | | | | | | |
| *100* | BAND SAW | | | | | | | | |
| Bandsaw | Memo | 0.00 | | | | | | | |
| Jaspa Bandsaw | Cut blank: 47.40" x (12.000" +0.100/-0.000) | | | 12-12-10 | | | | | |
| 110 | | 0.00 | | | | | | | |
| *110* | HAAS CNC VERTICAL MACHINING #1 | | | | | | | | |
| HAAS 1 | Memo | 0.00 | | PO 12-12-16 | | 2 | 0 | | |
| HAAS CNC vertical machine #1 | 1-Machine part as per Folio FA291 and Dwg D31772-Deburr | | | | | | | | |
| 120 | | 0.00 | | | | | | | |
| *120* | QC2- Inspect parts off machine FAI/FAIB | | | | | | | | |
| QC | Memo | 0.00 | | PO 12-12-17 | | 2 | 0 | | |
| Quality Control | | | | | | | | | |

(Handwritten signature/initials)

Work Order ID 94309

94309

Page 2

December-06-12 11:48:22 AM

Item ID: D3177-041 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
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 Start Date: 12/06/12 Start Qty: 2.00 ***2*** Cust Item ID:
 Required Date: 12/13/12 Req'd Qty: 2.00 ***2*** Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start ***NR1***
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop ***NR2***

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|---|--|----------------------|---------|----------|--------------|---------------|---------------|------------------|----------------|
| 130 *130* QC Quality Control | QC8- Inspect parts - second check Memo | 0.00 0.00 | | 12/12/21 | | 2 | 0 | | DAS 08 |
| 140 *140* HandFinish Hand Finishing | Chemical Conversion Coat per QS1005 4.1 Memo | 0.00 0.00 | | | | 2 | | RB 2-1-13 | |
| 150 *150* Small Fab Small Fab | Small Fab Memo 1-Press D3177-5 Spacers as shown on Dwg D3177 | 0.00 0.00 | | | | 2x | | | ES 13/01/10 |

Work Order ID 94309

December-06-12 11:48:22 AM

94309

Page 3

Item ID: D3177-041 Accept *N900040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Bracket
 Start Date: 12/06/12 Start Qty: 2.00 *2* Cust Item ID:
 Required Date: 12/13/12 Req'd Qty: 2.00 *2* Customer:
 Reference:

Approvals: Process Plan: Date: Tooling: Date: Run Start *NR1*
 QC: Date: SPC (Y/N): Date: Stop *NR2*

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|---|--|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
| 160 *160* Powdercoat Powder Coating | White Gloss(Ref.4.3.5.1)per QSI005 4.3-Alum M123383 Memo START TIME: 1:05 OVEN TEMPERATURE: 3:00 FINISH TIME: 1:35 | 0.00 0.00 | | | | 2 | 0 | 13-1-14 | |
| 170 *170* QC Quality Control | QC3- Inspect Part Finish Memo | 0.00 0.00 | | | | 2x | | 13/01/15 | |
| 180 *180* Small Fab Small Fab Small Fab | Small Fab Memo Assemble as per Dwg D3177 | 0.00 0.00 | | | | 2x | | 13/01/15 | |

94309

December-06-12 11:48:22 AM

N900040100

Setup Start *NS1*

Stop *NS2*

Start Date: 12/06/12 **Start Qty:** 2.00 ***2***

Cust Item ID:

Required Date: 12/13/12 **Req'd Qty:** 2.00 ***~***

Customer:

Reference:

Run Start *NR1*

Approvals: **Process Plan:** **Date:** _____ **Tooling:** _____ **Date:** _____

Stop *NR2*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

**Insp.
Stamp**

190

QC5- Inspect part completeness to step on W/O

0.00

190

QC

Memo

0.00

Quality Control

AS
15
89
13.1.15

200

Identify as per dwg & Stock Location: ST/66 0.00

0.00

200

Packaging

Memo

0.00

Packaging

2x _____ SP
13-01-18

210

QC21- Final Inspection - Work Order Release

0.00

210

OC

Memo

0.00

Quality Control

13/1/14 ~~JD~~

1013-01-15

Picklist Print

December-06-12 11:48:21 AM

Page 1

Work Order ID: 94309

Parent Item: D3177-041

Parent Item Name: Bracket

Start Date: 12/06/12

Required Date: 12/13/12

Start Qty: 2.00

Required Qty: 2.00

Comments: IPP Rev:B03.01.27Added Step 12KJ/RF

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| AN960JD10 Washer | NAS1149D0363J | Purchased | No | | | 180 | Each | 0.0000 | 3 | | | | |
| BLRS-010 Pip Pin | | Purchased | No | | | 180 | Each | 36.0000 | 1 | | | | |

Location

Loc Qty

Loc Code

| | | |
|--------|----|--|
| FG | 4 | |
| 121374 | 4 | |
| ST283 | 32 | |
| 118207 | 1 | |
| 120178 | 2 | |
| 122730 | 29 | |

D2690-6
Lanyard Assembly

Manufactured No

180 Each 30.0000

1 2

Location

Loc Qty

Loc Code

| | | |
|-------|----|--|
| GA | 3 | |
| 91957 | 3 | |
| ST014 | 27 | |
| 90568 | 2 | |
| 91642 | 1 | |
| 92559 | 4 | |
| 92739 | 6 | |
| 92867 | 4 | |
| 93401 | 10 | |

D2690-6RevB2
Lanyard Assembly

Manufactured No

180 Each 0.0000

1 2

D3177-5
Spacer

Manufactured No

180 Each 13.0000

4 8

Location

Loc Qty

Loc Code

| | | |
|-------|----|--|
| ST032 | 13 | |
| 20295 | 13 | |

B95228 (3x)

Picklist Print

December-06-12 11:48:21 AM

Page 2

Work Order ID: 94309

Parent Item: D3177-041

Parent Item Name: Bracket

Start Date: 12/06/12

Required Date: 12/13/12

Start Qty: 2.00

Required Qty: 2.00

~~MS21042L3~~ 12.000/ 12/12/10

Spacer

M6061T6B1.000X13.000

6061T6 BAR 1.00 X 13.00

MS21042L3

Nut

Manufactured No

Purchased No

Purchased No

180 Each 0.0000

f 0.0000

180 Each 4,811.0000

3.96 4

1 2

Location

Loc Qty

Loc Code

FP001

141

122141

141

GA

419

122452

419

ST300

225

117885

32

119017

55

119075

138

ST314

526

123265

526

ST506

3500

123900

3500

MS27039-1-11

Purchased No

100 Each 137.0000

Screw

Location

Loc Qty

Loc Code

GA

37

9662

37

ST305

100

123352

100

12-12-10
13/01/10

2
13/01/15

2

December-06-12 11:48:21 AM

Shop Packet Print


Page 2


| | | |
|----------------------------------|----------------|-----------------------------|
| D3065-5DART AEROSPACE LTD | | Work Order: 94309 |
| Description: Bracket | | Part Number: D3177-1 |
| Inspection Dwg: D3177 | Rev: B2 | Page 1 of 1 |

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

| Drawing Dimension | Tolerance | Actual Dimension | Accept | Reject | Method of Inspection | Comments |
|-------------------|---------------|------------------|--------|--------|----------------------|----------|
| 0.970 | +0.010/-0.000 | .973 | ✓ | | Mic | 118-120 |
| R0.125 | +/-0.010 | .125 | ✓ | | Rad gage | |
| 0.700 | +0.010/-0.000 | .694 | | | Mic | PHD-02 |
| 0.188 | +0.010/-0.000 | .193 | ✓ | | Mic | 118-120 |
| 0.300 | +/-0.010 | .295 | ✓ | | VERN | PHD-01 |
| 10.776 | +/-0.005 | 10.773 | ✓ | | VERN | CNC-02 |
| R0.625 | +/-0.010 | .625 | ✓ | | Rad gage | |
| Ø0.261 | +0.005/-0.000 | .267 | ✓ | | VERN | PHD-01 |
| 0.200 | +/-0.010 | .182 | | | " | " |
| 0.970 | +0.010/-0.000 | .973 | ✓ | | Mic | 118-120 |
| Ø0.203 | +/-0.005 | .205 | ✓ | | VERN | PHD-01 |
| Ø0.625 | +0.001/-0.000 | .626 | ✓ | | Mic | PHD-02 |
| 3.733 | +0.000/-0.005 | 3.733 | ✓ | | VERN | PHD-01 |
| 0.970 | +0.010/-0.000 | .973 | ✓ | | " | " |
| 0.700 | +0.010/-0.000 | .694 | | | Mic | PHD-02 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

| | | | |
|------------------------|---|----------------------------|-----|
| Measured by: PO | Audited by: JA  | Prototype Approval: | N/A |
| Date: 12-12-17 | Date: 12/12/21 | Date: | N/A |

| Rev | Date | Change | Revised by | Approved |
|-----|----------|-----------|-----------------------------|---|
| A | 04.02.25 | New Issue | P/O D3177-041/-043 KJ/RF |  |

2.5606

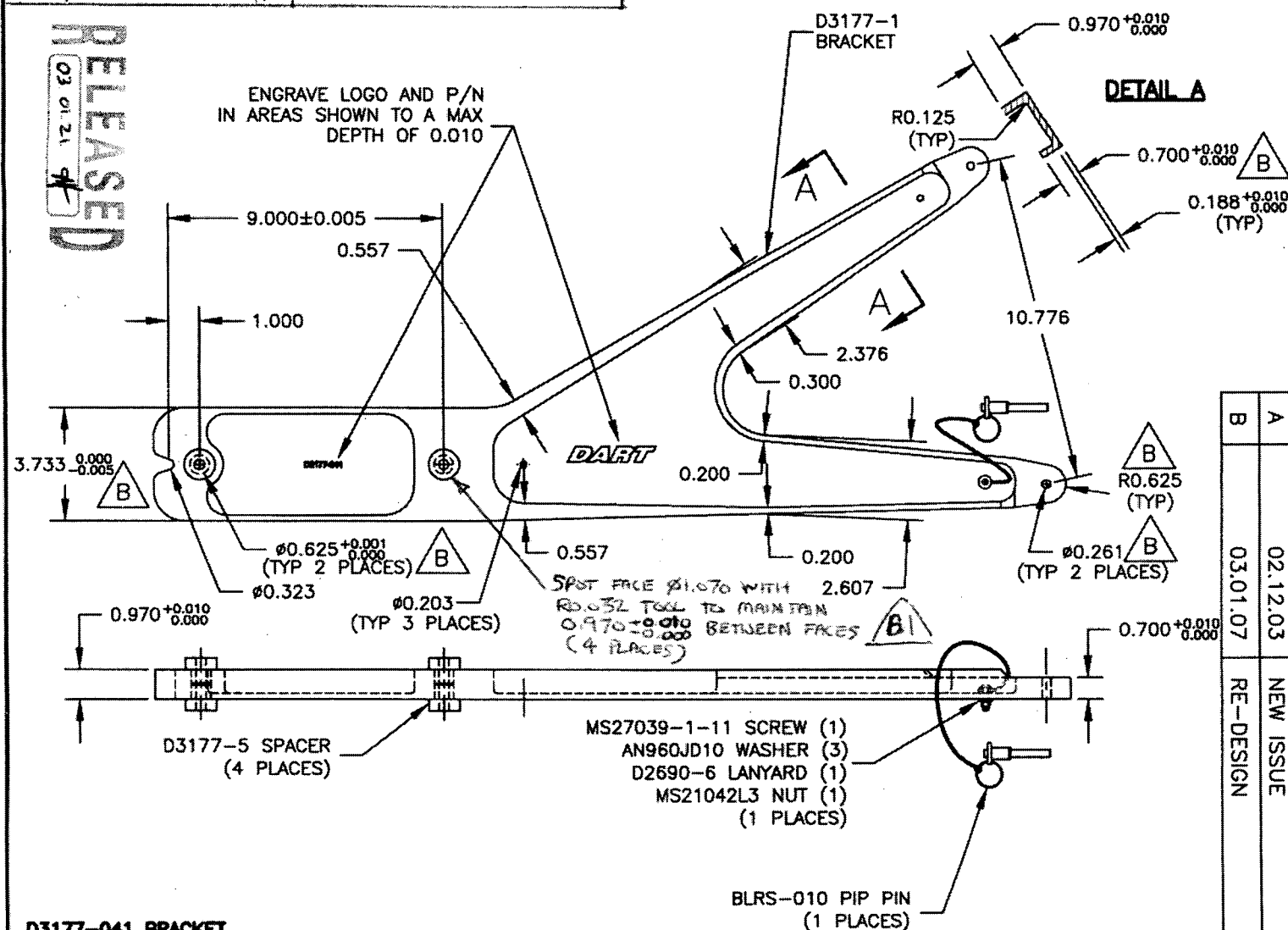
DART



DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

| DESIGN | DRAWN BY | DART AEROSPACE LTD |
|----------|----------|--------------------|
| CHECKED | APPROVED | DRAWING NO. |
| DATE | | TITLE |
| 03.01.07 | 02.12.03 | BRACKET |
| A | 03.01.07 | NEW ISSUE |
| B | | RE-DESIGN |
| | | SCALE |
| | | 1:5 |
| | | SHEET 1 OF 3 |
| | | REV. B |

| | | | |
|----|----------|------|---------------|
| B1 | 03.02.25 | CP-# | ADD SPOT FACE |
| B2 | 03.11.24 | CP-# | ADD D3177-7 |



D3177-041 BRACKET

- 1) MACHINE D3177-1 PER DART DWG "D3177-1.SLDPRT"
MATERIAL: 6061-T6 ALUMINUM BAR (QQ-A-250/11 OR QQ-A-200/8)
(REF DART SPEC. M6061T6S OR M6061T6B)
- 2) BREAK ALL SHARP EDGES 0.005 TO 0.015
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 (PRIOR TO ASSEMBLY)
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3 (AFTER ASSEMBLY)
- 4) TOLERANCES ARE PER QSI 018 UNLESS OTHERWISE NOTED
- 5) ALL DIMENSIONS ARE IN INCHES

94309

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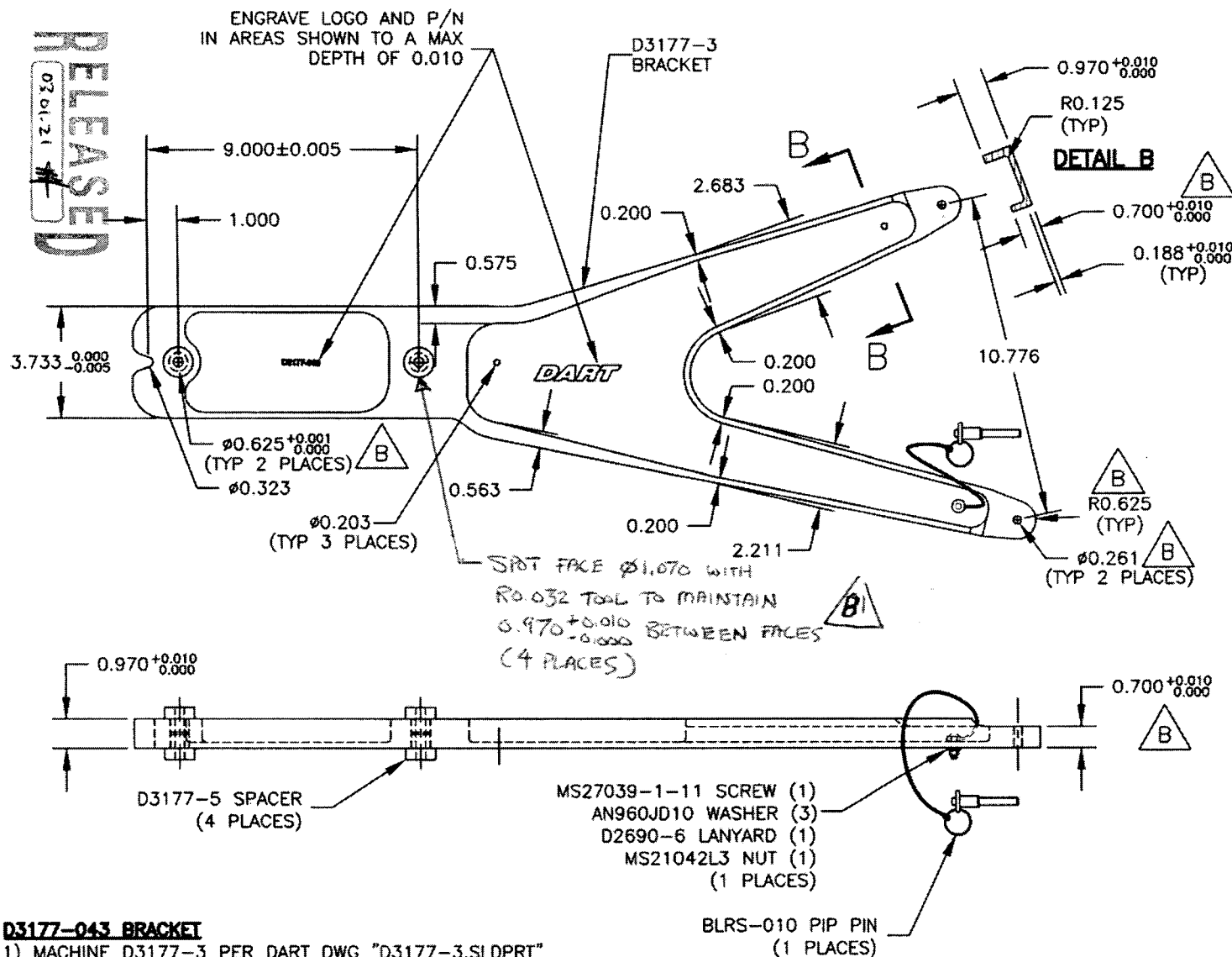
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RELEASED
03.01.21

DART



| | | | |
|---------|----------|--------------|-----------------------------|
| DESIGN | APPROVED | DRAWN BY | DART AEROSPACE LTD |
| CHECKED | APPROVED | DRAWING NO. | HAWKESBURY, ONTARIO, CANADA |
| DATE | 03.01.07 | TITLE | BRACKET |
| | | SCALE | 1:5 |
| | | SHEET 2 OF 3 | |
| | | REV. B | |



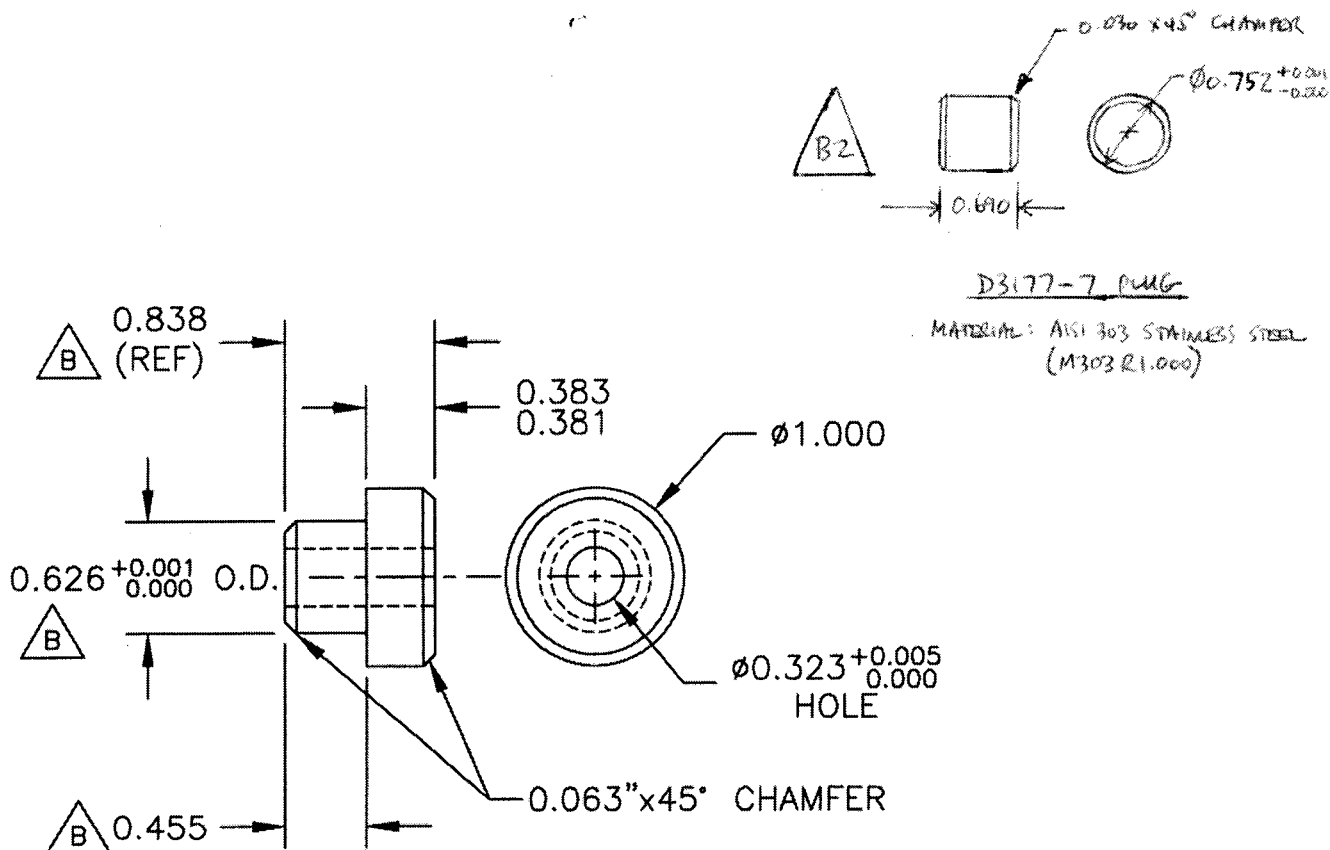
D3177-043 BRACKET

- 1) MACHINE D3177-3 PER DART DWG "D3177-3.SLDPR" MATERIAL: 6061-T6 ALUMINUM BAR (QQ-A-250/11 OR QQ-A-200/8) (REF DART SPEC. M6061T6S OR M6061T6B)
- 2) BREAK ALL SHARP EDGES 0.005 TO 0.015
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1 (PRIOR TO ASSEMBLY) POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3 (AFTER ASSEMBLY)
- 4) TOLERANCES ARE PER QSI 018 UNLESS OTHERWISE NOTED
- 5) ALL DIMENSIONS ARE IN INCHES

RELEASED
03.01.21



| | | | |
|-------------------------------|--------------------------------|---|------------------------|
| DESIGN <i>UP</i> | DRAWN BY <i>UP</i> | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | |
| CHECKED <i>[Signature]</i> | APPROVED <i>[Signature]</i> | DRAWING NO. D3177 | REV. B SHEET 3 OF 3 |
| DATE 03.01.07 | | TITLE BRACKET | SCALE 1:1 |



D3177-5

- 1) MATERIAL: 6061-T6 ALUMINUM BAR $\phi 1.000$
(QQ-A-200/8 OR QQ-A-225/8)
(REF DART SPEC. M6061T6R1.000)
- 2) BREAK ALL SHARP EDGES 0.005 TO 0.010
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 4) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 5) ALL DIMENSIONS ARE IN INCHES

RELEASED
03 01-21 *[Signature]*

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NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

| | | | | | | | | | | | | | | | | | | |
|---|--|---|--------------------------------------|------------------------------------|------------------------------------|--------------------------------------|---|------------------------------------|--|----------------------------------|--|------------------------------------|--|--------------------------------|------------------------------------|------------------------------------|-----------------------------------|--|
| Work Order: <u>94309</u> Part No. _____ NCR No. _____ | DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input checked="" type="checkbox"/> Work Order Update <input type="checkbox"/> | AGAINST DEPARTMENT/PROCESS <table style="width:100%; font-size: small;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input checked="" type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table> | Skid-tube <input type="checkbox"/> | Crosstube <input type="checkbox"/> | Water Jet <input type="checkbox"/> | Engineering <input type="checkbox"/> | Machining <input checked="" type="checkbox"/> | Small Fab <input type="checkbox"/> | Prod. Eng. Coord. <input type="checkbox"/> | Quality <input type="checkbox"/> | Thermoforming <input type="checkbox"/> | Finishing <input type="checkbox"/> | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/> | Large Fab <input type="checkbox"/> | Composite <input type="checkbox"/> | Supplier <input type="checkbox"/> | |
| Skid-tube <input type="checkbox"/> | Crosstube <input type="checkbox"/> | Water Jet <input type="checkbox"/> | Engineering <input type="checkbox"/> | | | | | | | | | | | | | | | |
| Machining <input checked="" type="checkbox"/> | Small Fab <input type="checkbox"/> | Prod. Eng. Coord. <input type="checkbox"/> | Quality <input type="checkbox"/> | | | | | | | | | | | | | | | |
| Thermoforming <input type="checkbox"/> | Finishing <input type="checkbox"/> | Rec/Store/Packaging <input type="checkbox"/> | Other <input type="checkbox"/> | | | | | | | | | | | | | | | |
| Large Fab <input type="checkbox"/> | Composite <input type="checkbox"/> | Supplier <input type="checkbox"/> | | | | | | | | | | | | | | | | |

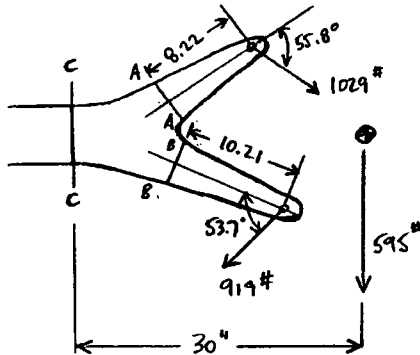
| Root Cause | Date | Step | Qty | Description of work order update or Non-conformance | Initial Chief Eng | Action Description | Sign & Date | Verification | QC Inspector |
|--|----------|------|-----|---|-------------------------------|--|-------------------------------|--------------|--------------|
| Doc/Data <input type="checkbox"/> | 12-12-17 | 110 | 1 | The Two Leg STEP DIM of .700 is under tolerance of .006. Reason: Wrong tool was used Qty 1 | DAS 12 2-83 12/12/17 | Acceptable. Margins of safety are still positive per SR-D130-701-1 Rev A | PD 12-12-17 | | |
| Equip/Tooling <input type="checkbox"/> | | | 2 | The Thickness of the Wall on one leg of .200 is .192 due to imperfection in Blank Material Qty 2 Parts | DAS 12 2-83 12/12/17 | Acceptable. Moment of inertia of section is larger than that analyzed in SR-D130-701-1 Rev A | DAS 12 2-83 12/12/17 | 12/12/17 | 12/12/17 |
| Operator <input checked="" type="checkbox"/> | | | | | | | | | |
| Material <input checked="" type="checkbox"/> | | | | | | | | | |
| Setup <input type="checkbox"/> | | | | | | | | | |
| Other <input type="checkbox"/> | | | | | | | | | |
| Process <input type="checkbox"/> | | | | | | | | | |
| Supplier <input type="checkbox"/> | | | | | | | | | |
| Training <input type="checkbox"/> | | | | | | | | | |
| Unapproved <input type="checkbox"/> | | | | | | | | | |

FAULT CATEGORY

| Landing Gear | General | Other |
|---|---|--|
| <input type="checkbox"/> Bending | <input type="checkbox"/> Bend | <input type="checkbox"/> Grain |
| <input type="checkbox"/> Centre Not Concentric to O/S | <input type="checkbox"/> BOM/Route | <input type="checkbox"/> Hardware |
| <input type="checkbox"/> Cracks | <input type="checkbox"/> Broken/Damaged | <input type="checkbox"/> Inspection Incomplete |
| <input type="checkbox"/> Crushed/Crimped | <input type="checkbox"/> Burrs | <input type="checkbox"/> Instructions Incomplete/Unclear |
| <input type="checkbox"/> Cuffs | <input type="checkbox"/> Contamination | <input type="checkbox"/> Maintenance |
| <input type="checkbox"/> Heat Treat | <input type="checkbox"/> Countersink | <input type="checkbox"/> Mislabeled |
| <input type="checkbox"/> Inspection Strip in Tube | <input type="checkbox"/> Cut Too Short | <input type="checkbox"/> Misread |
| <input type="checkbox"/> Ripples in Bend | <input type="checkbox"/> Drill Holes | <input type="checkbox"/> Offset |
| <input type="checkbox"/> Torque Waves in Extrusion | <input type="checkbox"/> Drawing | <input type="checkbox"/> Out of Calibration |
| <input type="checkbox"/> Turning Sequence | <input type="checkbox"/> Finish | <input type="checkbox"/> Out of Sequence |
| <input type="checkbox"/> Wave/Twist in Tube | <input type="checkbox"/> Folio | <input type="checkbox"/> Outside Dimensions |
| | | <input type="checkbox"/> Ovalized |
| | | <input type="checkbox"/> Over/Under tolerance |
| | | <input type="checkbox"/> Part Incorrect |
| | | <input type="checkbox"/> Part Lost/Missing |
| | | <input type="checkbox"/> Part Moved |
| | | <input type="checkbox"/> Positioned Wrong |
| | | <input type="checkbox"/> Power Loss/Surge |
| | | <input type="checkbox"/> Pressure/Forced |
| | | <input type="checkbox"/> Temperature/Cure |
| | | <input type="checkbox"/> Weld |
| | | <input type="checkbox"/> Wrong Stock Pulled |
| | | <input type="checkbox"/> Other |
| | | <u>Me-1 - operator error</u> |
| | | <u>Me-2 - Material</u> |

| | | | |
|------------------|---------------|---|------------------------|
| DESIGN # | DRAWN BY # | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | |
| CHECKED # | APPROVED # | DRAWING NO. SR-D130-701-1 | REV. A SHEET 6 OF 9 |
| DATE 02.11.26 | | TITLE STRESS REPORT | SCALE NTS |

6.2 AFT BRACKET (D3177-043)



SECTION A-A

$$\text{FROM } F_z : M_{A-A} = (1029 \#)(1.5) \cos(90^\circ - 55.8^\circ)(8.22") \\ = 10494 \text{ in}\cdot\text{lb}$$

$$\text{FROM } F_x : M_{A-A} = (196 \#)(1.5) / 2 \times 8.22" = 1208 \text{ in}\cdot\text{lb}$$

SECTION B-B

$$\text{FROM } F_z : M_{B-B} = (919 \#)(1.5) \cos(90^\circ - 53.7^\circ)(10.21") \\ = 11343 \text{ in}\cdot\text{lb}$$

$$\text{FROM } F_x : M_{B-B} = (196 \#)(1.5) / 2 \times 10.21" = 1500 \text{ in}\cdot\text{lb}$$

SECTION C-C

AT THIS SECTION, D3177-041 IS WORST CASE AND THE MOMENTS WILL BE THE SAME.

6.3 MARGINS SUMMARY

| Part | Section | Direction | (M)max (in lb) | Fcy/Ftu (psi) | I (in ⁴) | <i>Actual</i> c (in) | (M)all (in lb) | MS |
|------------|---------|-----------|-------------------|------------------|-------------------------|----------------------------|-------------------|------|
| D3177-041 | A-A | z | 13791 | 34000 | 0.642 | 1.28 | 17053 | 0.24 |
| D3177-041 | A-A | x | 1419 | 34000 | 0.056 | 0.67 | 2842 | 1.00 |
| D3177-041 | B-B | z | 8497 | 34000 | 0.665 | 1.38 | 16384 | 0.93 |
| D3177-041 | B-B | x | 1357 | 34000 | 0.043 | 0.72 | 2031 | 0.50 |
| D3177-041 | C-C | z | 26775 | 34000 | 3.178 | 1.87 | 57782 | 1.16 |
| *D3177-041 | C-C | x | 5880 | 34000 | 0.145 | 0.60 | 8217 | 0.40 |
| *D3177-041 | C-C | x | 8820 | 38000 | 0.145 | 0.60 | 9183 | 0.04 |
| D3177-043 | A-A | z | 10494 | 34000 | 0.731 | 1.43 | 17380 | 0.66 |
| D3177-043 | A-A | x | 1208 | 34000 | 0.044 | 0.72 | 2078 | 0.72 |
| D3177-043 | B-B | z | 11343 | 34000 | 0.441 | 1.18 | 12761 | 0.12 |
| D3177-043 | B-B | x | 1500 | 34000 | 0.042 | 0.71 | 2020 | 0.35 |

* THE ABOVE TABLE SHOWS ULTIMATE LOADS TO YIELD PROPERTIES, EXCEPT FOR SECTION C-C, WHERE BOTH THE LIMIT & ULTIMATE CALCULATIONS HAVE BEEN DONE TO DEMONSTRATE POSITIVE MARGINS.

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7.1 Fastener Analysis

| Location | Load | Type | E | n | $1.15 \cdot 1.5 \cdot F/n$ | Fmax | MS |
|----------|--------------|-----------|------|---|----------------------------|-------|------|
| 1 | Double Shear | AN4 | 1029 | 1 | 1775 | 7360 | 3.15 |
| 2 | Double Shear | MS17984C5 | 2645 | 1 | 4563 | 14400 | 2.16 |
| 3 | Double Shear | AN5 | 2050 | 1 | 3536 | 11500 | 2.25 |
| 4 | Tensile | AN3 | 1758 | 4 | 758 | 3130 | 3.13 |
| 5 | Double Shear | MS17984C5 | 1758 | 1 | 3033 | 14400 | 3.75 |

7.2 Limit Bearing Analysis

| Location | Part | Material | E | n | $1.15 \cdot F/n$ | D | t | e/D | Fbrv | Fb | MS |
|----------|----------------|-----------------|------|---|------------------|-------|-------|------|-------|-------|------|
| 1 | D3172-041 | AISI 304/316 SS | 1029 | 2 | 592 | 0.250 | 0.063 | >2.0 | 55000 | 866 | 0.46 |
| → 1 | D3177-041/-043 | 6061-T6 | 1029 | 1 | 1183 | 0.250 | 0.694 | >2.0 | 60000 | 10410 | 7.80 |
| 2 | D3177-041/-043 | 6061-T6 | 2645 | 1 | 3042 | 0.313 | 0.970 | >2.0 | 60000 | 18217 | 4.99 |
| 2 | D3173-041 | 6061-T6 | 2645 | 2 | 1521 | 0.313 | 0.125 | >2.0 | 60000 | 2348 | 0.54 |
| 3 | D3177-041/-043 | 6061-T6 | 2050 | 1 | 2358 | 0.313 | 0.970 | >2.0 | 60000 | 18217 | 6.73 |
| 3 | D3173-041 | 6061-T6 | 2050 | 2 | 1179 | 0.313 | 0.125 | >2.0 | 60000 | 2348 | 0.99 |
| 5 | D3175-041 | 6061-T6 | 1758 | 2 | 1011 | 0.313 | 0.125 | 1.24 | 39960 | 1563 | 0.55 |

7.3 Ultimate Bearing Analysis

| Location | Part | Material | E | n | $1.15 \cdot 1.5 \cdot F/n$ | D | t | e/D | Fbru | Fb | MS |
|----------|----------------|-----------------|------|---|----------------------------|-------|-------|------|--------|-------|------|
| 1 | D3172-041 | AISI 304/316 SS | 1029 | 2 | 888 | 0.250 | 0.063 | >2.0 | 162000 | 2552 | 1.87 |
| → 1 | D3177-041/-043 | 6061-T6 | 1029 | 1 | 1775 | 0.250 | 0.694 | >2.0 | 82000 | 14227 | 7.02 |
| 2 | D3177-041/-043 | 6061-T6 | 2645 | 1 | 4563 | 0.313 | 0.970 | >2.0 | 82000 | 24896 | 4.46 |
| 2 | D3173-041 | 6061-T6 | 2645 | 2 | 2281 | 0.313 | 0.125 | >2.0 | 82000 | 3208 | 0.41 |
| 3 | D3177-041/-043 | 6061-T6 | 2050 | 1 | 3536 | 0.313 | 0.970 | >2.0 | 82000 | 24896 | 6.04 |
| 3 | D3173-041 | 6061-T6 | 2050 | 2 | 1768 | 0.313 | 0.125 | >2.0 | 82000 | 3208 | 0.81 |
| 5 | D3175-041 | 6061-T6 | 1758 | 2 | 1516 | 0.313 | 0.125 | 1.24 | 47360 | 1853 | 0.22 |

7.4 Limit Shear Analysis

| Location | Part | Material | E | n | $1.15 \cdot F/n$ | e | t | Fsy | Fs | MS |
|----------|----------------|-----------------|------|---|------------------|-------|-------|-------|-------|-------|
| 1 | D3172-041 | AISI 304/316 SS | 1029 | 2 | 592 | 0.621 | 0.063 | 15753 | 1233 | 1.08 |
| → 1 | D3177-041/-043 | 6061-T6 | 1029 | 1 | 1183 | 0.561 | 0.694 | 23263 | 18114 | 14.31 |
| 5 | D3175-041 | 6061-T6 | 1758 | 2 | 1011 | 0.242 | 0.125 | 23263 | 1407 | 0.39 |

7.5 Ultimate Shear Analysis

| Location | Part | Material | E | n | $1.5 \cdot 1.15 \cdot F/n$ | e | t | Fsu | Fs | MS |
|----------|----------------|-----------------|------|---|----------------------------|-------|-------|-------|-------|-------|
| 1 | D3172-041 | AISI 304/316 SS | 1029 | 2 | 888 | 0.621 | 0.063 | 55000 | 4304 | 3.85 |
| → 1 | D3177-041/-043 | 6061-T6 | 1029 | 1 | 1775 | 0.561 | 0.694 | 26000 | 20245 | 10.41 |
| 5 | D3175-041 | 6061-T6 | 1758 | 2 | 1516 | 0.242 | 0.125 | 26000 | 1573 | 0.04 |

MARGINS are positive with lug thickness
of 0.694. ∴ Acceptable 9/24/21